

DTI 论文投稿

Title: Visual Exploration of Differences among DTI Fiber Models

Abstract:

In-vivo studies of fibrous structures require non-invasive tools, of which one is fiber tracking based on Diffusion Tensor Imaging (DTI) datasets. Different fiber models can be produced from different DTI images, which may vary from subject to subject due to variations in anatomy, motions in scanning, and signal noises. Additionally, parameters of the tracking method also have a great influence on resulting models. Illustrating, exploring, and analyzing differences among DTI fiber models are crucial for the purposes of group comparison, atlas construction, and uncertainty analysis. Conventional approaches illustrate fiber models in 3D space and explore differences either voxel-wisely or fiber-based. However, these approaches rely on accurate alignment processes and may easily be disturbed by visual clutters. In this paper, we introduce a two-phase projection technique to illustrate a complex 3D fiber model with a unique 2D map to characterize features for further exploration and analysis. Moreover, regions of significant differences among the maps are marked out. In these 2D maps, differences can be easily distinguished without occlusions that often occur in 3D spaces. To facilitate comparative analysis from multiple perspectives, we design an interface for interactive exploration. The effectiveness of our approach is evaluated with two datasets.

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论文阅读

- [1] L. Grammel, M. Tory, and M. A. Storey, "How information visualization novices construct visualizations," *IEEE TVCG*, vol. 16, no. 6, pp. 943–952, 2010.

测试新手进行可视化设计时的行为、思路和遇到的困难。里面提到的很多可视化设计遇到的难点和现有工具的局限性和我思考的非常接近，但是更加系统具体且有干货

- [2] J. Heer, T. Ropinski, and J. Van Wijk, "Reverse-Engineering Visualizations: Recovering Visual Encodings from Chart Images," in *Eurographics Conference on Visualization (EuroVis)*, 2017, vol. 36, no. 3.

逆向工程，主要通过文本识别来判断图表中各个结构的职责并重新组织成数据

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- [3] N. Elmqvist, J. Stasko, and P. Tsigas, "Data meadow: a visual canvas for analysis of large-scale multivariate data," *Inf. Vis.*, vol. 7, pp. 18–33, 2008.

将 D3 生成的图表转变为可复用的模板。支持的内容比较固定，相对于 D3 来说可能更接近 VEGA 的范畴

- [4] K. Wongsuphasawat, D. Moritz, A. Anand, J. Mackinlay, B. Howe, and J. Heer, "Towards a general-purpose query language for visualization recommendation," *Proc. Work. Human-In-the-Loop Data Anal. - HILDA '16*, pp. 1–6, 2016.

说是 query language，其实是对现有的推荐系统进行了分类总结，没有做任何代码实现

- [5] A. McNamara, "On the State of Computing in Statistics Education: Tools for Learning and for Doing," 2016.

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